

PATENT APPLN. NO. 10/807,378
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

REMARKS

Claims 1-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 01/31720 (identified by the Office in the Action as "Fujimoto") in view of U.S. Patent No. 5,998,052 ("Yamin"). It is noted that the Office has provided an "Official English" translation of Fujimoto. However, Fujimoto corresponds to U.S. Patent No. 7,195,842. (Please refer to the printout of the first page of the full text of U.S. Patent No. 7,195,842 from the USPTO Patent Full Text and Image Database).

The Office identifies Fujimoto as teaching a lithium secondary battery that includes a negative electrode within the scope of the negative electrode of the lithium secondary battery defined in the rejected claims. The Office notes that Fujimoto does not "teach a method of charging the lithium secondary battery within a range of state of charge (i.e. not fully charging the battery)." (Action, page 3, lines 6-7).

Yamin is cited as teaching a method of "partially charging a lithium ion rechargeable battery such that it is not fully charged (column 5, lines 19-31)". (Action, page 3, lines 8-9).

The position of the Office is that it would have been obvious to partially charge the battery of Fujimoto as taught by Yamin.

The rejection is not proper. Yamin discloses charging a

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battery to some percentage (e.g., 5-10%) of its full charge.

State of charge is not a percentage of full charge.

As described in the specification of the present application, a battery in which no peak except for a peak corresponding to the current collector is observed in the X-ray diffraction pattern of the negative electrode during charging using CuK_α -radiation as the X-ray source is obtained by adjusting an amount of a positive electrode active material or by controlling a charge ending voltage of the battery by a battery charger. (See paragraph [0012]).

More specifically, as described in paragraph [0025]:

"In the lithium secondary battery of the invention the characteristic that no peak corresponding to a compound of silicon and lithium is observed in an X-ray diffraction pattern of the negative electrode during charging using CuK_α -radiation as the X-ray source is obtained by limiting the amount of positive electrode active material to an amount which limits the charge capacity of the battery to 90 % or less of the maximum capacity of the negative electrode."

(Emphasis applicants').

And, as described in paragraph [0027]:

"It is also possible to provide the the [sic]

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characteristic that no peak corresponding to a compound of silicon and lithium is observed in an X-ray diffraction pattern of the negative electrode during charging using CuK_α -radiation as the X-ray source by combining a lithium secondary battery of the present invention ... with a battery charger which controls a charge ending voltage of the battery to that which limits charging to within a range of state of charge (SOC) where no peak corresponding to a compound [sic] of silicon and lithium is observed in an X-ray diffraction pattern of the negative electrode during charging using CuK_α -radiation as the X-ray source."

(Emphasis applicants').

Therefore, partially charging a lithium secondary battery which includes a negative electrode having an active material layer including silicon provided on a current collector comprising a metal which does not form an alloy with lithium will not result in the battery or method of the present invention.

Withdrawal of the 35 U.S.C. § 103(a) rejection of claims 1-16 over Fujimoto in view of Yamin and a notice of allowability of the present application are believed to be in order and are respectfully requested.

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The foregoing is believed to be a complete and proper response to the Office Action dated August 28, 2009.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 111833.

In the event any additional fees are required, please also charge our Deposit Account No. 111833.

Respectfully submitted,

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